ANALYSIS OF PROJECT MANAGEMENT SOFTWARE

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The article highlights the features of IT project management software to determine the best option with the best quality characteristics and high efficiency by saving time, financial and material resources. It is noted that IT companies can achieve a competitive advantage by implementing project management information systems, namely a comprehensive project management system. The author describes the basic and instrumental parts of the system, its functions, which are implemented using information technology. Modern information technologies are based he such principles as: interactive fashion of operation, flexibility of the process, integration (coherence) with software products. The task of information technology project management is to provide the user with a wide range of functionalities for project activities. Project management systems are considered as sets of tools, methodologies, methods and resources used in the management process, including tools for task planning, scheduling, budget management, resource allocation, documentation, reporting, collaboration. The author analyzes six project management systems: ActiveCollab, JIRA, BaseCamp, Trello, Wrike, TeamworkProjects, describes the functionality of each tool. The article presents the results of comparing project management systems, substantiates the differences and advantages of services, provides recommendations for choosing a project management system. Also he the basis of the presented analysis the alternative in the form of development of own software decision and its expediency is considered.

АНАЛІЗ ПРОГРАМНИХ ЗАСОБІВ ДЛЯ УПРАВЛІННЯ ПРОЄКТАМИ

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У статті висвітлюються особливості програмних засобів управління ІТ проєктами для визначення оптимального варіанта з найкращими характеристиками якості і високою ефективністю за рахунок економії часу, фінансових та матеріальних ресурсів. Зазначено, що ІТ підприємства можуть досягти конкурентної переваги шляхом впровадження інформаційних систем управління проєктами, а саме с комплексної системи управління проєктами. Автором описано базову та інструментальну частини системи, її функції, що реалізуються за допомогою інформаційних технологій. В основу сучасних інформаційних технологій покладено такі принципи як: інтерактивний режим роботи, гнучкість процесу, інтегрованість (узгодженість) з програмними продуктами. Завдання інформаційних технологій управління проєктами полягає у наданні користувачеві широкого спектру функціональних можливостей щодо проєктної діяльності. Системи управління проєктами розглянуто як набори інструментів, методології, методів і ресурсів, що використовуються в процесі управління, включають засоби для планування завдань, складання розкладу, управління бюджетом, розподілу ресурсів, документування, формування звітів, спільної роботи виконавців. Автор аналізує шість систем управління проєктами: ActiveCollab, JIRA, BaseCamp, Trello, Wrike, TeamworkProjects, описує функціональні можливості кожного інструменту. В статті наведено результати порівняння систем управління проєктами, обґрунтовано відмінності та переваги сервісів, надано рекомендації щодо вибору системи управління проєктами. Також на підставі представленого аналізу розглядається альтернатива у вигляді розробки власного програмного рішення та його доцільність.

Statement of the problem

The activities of a modern organization are closely related to the implementation of a large number of different works, implementation of projects, implementation of management instructions, approval of documents, preparation of tender documents, etc. Planning and monitoring the implementation of all these types of work is complicated by the large number of projects, deadlines and those responsible for their implementation. Developments in the field of information technologies and, in particular, in the field of project management systems allow to significantly increase the efficiency of management of these activities. The choice between purchasing existing software solutions and developing your own information system is relevant for bridge organizations that plan to increase the efficiency of their activities by automating the processes of planning and control. Project management includes planning, organization and control of labor, financial and logistical resources aimed at effectively achieving project objectives. Therefore, one of the ways to solve the problem of improving the efficiency of project management is the implementation of appropriate software. The use of automated project management systems has long been limited to traditional areas (large construction, engineering, defense projects) and required professional knowledge, but over the past decade the situation in the use of scheduling software and project management has changed dramatically [1]. There are a number of universal PC software packages he the market today that vending machines project planning and control.

The current stage of project market formation is characterized by increasing requirements for project management systems that will reduce the risks of making incorrect management decisions.

Analysis of recent studies and publications

In IT project management it is important to combine all management functions and create flexible systems that allow you to quickly assess the effectiveness of IT project, IT project planning, planning and management of material flows, monitoring the implementation of IT project processes, as well as planning strategic activities of IT companies [2]. Development of information systems based he the integration of organizational and technical systems, as well as the use of intelligent methods for solving management problems are considered in the scientific works of V.M. Antonenko [3]. The authors investigated the making of managerial decisions in organizational and technical systems [4; 5]. Bashinska I. and Novak N. substantiate the bridge important requirements for software in IT project management [6]. In his article, Prokopenko T. compares in detail two software tools for project management, namely Trello and Jira [7]. However, for an IT project in the management process it is important to take into account the factors of rapid change of circumstances, when it is necessary to cover a large amount of incoming information, compare it with existing information, take into account past experience, understand different situations, interventions in management decisions. [8]. That is, the factor of software versatility becomes important, which should be taken into account when choosing a software in IT project management systems.

Objectives of the article

The purpose of this article is to study the software tools for IT project management to determine the best option with the best quality characteristics and high efficiency by saving time, financial and material resources.

The main material of the research

IT companies can achieve a competitive advantage by implementing project management information systems that, based on complete, reliable and up-to-date information, accelerate management decisions. Information systems can be implemented in the form of a corporate information system (covering the automation of all management functions and the entire cycle of project work) or individual functional subsystems operating in the enterprise. The formation of an information support system based on individual functional subsystems is impossible due to low integration of project information and, as a consequence, obtaining low quality information. Therefore, an effective approach is to create a comprehensive project management system, which includes a basic part, which includes organizational, legal, informational, technical and software and tool part, which includes those elements that determine its purpose and capabilities of information management. The instrumental part is considered a project management model, it is built on the basis of three components: available resources, planned work and the matrix of distribution of project work. The functions of the project management system are implemented with the help of information technology, which consists of clearly regulated actions of personnel for information processing. Modern information technologies are based on the following principles: interactive mode of operation; flexibility of the process of changes in both data and task setting; integration (consistency) with other software products. The task of project management information technology is to provide the user with a wide range of functionalities for project activities by the following means: description of project parameters and works; multilevel project presentation; formation of the list of resources, volumes of works, etc .; calendar and network planning; graphic representation of the project structure; project implementation monitoring; creation of reports and standardization of electronic document management; organization of communication (work in a network environment). Software tools used in the practice of project activities can be divided into the following groups: spreadsheets, artificial intelligence systems, integrated integrated enterprise management systems, specialized project management software products.

Project management systems are sets of tools, methodologies, methods and resources used in the management process, including tools for task planning, scheduling, budget management, resource allocation, documentation, reporting, collaboration. At the heart of

any project management system is a management plan that describes how the system will be used. The content of the latter varies depending on the scope, features of the organization, the complexity of the project and the availability of the necessary resources. The system is built to best meet the strategic goals and production resources of the organization. Modern development of information technology has led to the emergence of a large number of web-based services available through the corporate network of the organization or the Internet, which facilitate the collaboration of a large number of distributed participants. Web-based systems and project management are project -oriented workspaces for one or more projects that are available to all participants. Project management systems usually include a project status bar, calendar, tasks (by project and responsible), list of employees (with the ability to view each workload), project plan, network schedule, project reports, time and attendance system, messaging system, file storage and documents.

The application of the project management system allows: create, implement and adjust the project work plan, effectively allocate material and human resources needed for project implementation, control the main indicators of pace and quality of project implementation, improve production efficiency, establish relationships in the implementation of various projects, take into account the advantages and disadvantages of the work performed when planning a new project. For effective management of project team members, it is necessary to see objective information about each active project: current tasks, the course of their implementation, calendar and network schedules, changes during project work. To increase efficiency, it is necessary to automate standard functions, improve the quality of planning, use the experience gained. Project management software covers a number of platforms, each with a different set of features. It is extremely important that the chosen software product simplifies project management and does not add unnecessary complexity.

Were selected for analysis, namely: ActiveCollab, JIRA, BaseCamp, Trello, Wrike, TeamworkProjects. These control systems today are quite popular in the market and cover almost all areas of application of such systems.

ActiveCollab is a cloud-based project management platform suitable for organizations of all sizes. It offers task management, time scheduling, teamwork, reporting tools and email integration. Task management tools include dashboards for each user that display their assigned tasks. Tasks can be filtered by time, by assigned users, or by special labels. Users can create tasks, attach files, set deadlines, add reminders, leave comments, and receive update notifications. Tasks can be viewed as a timeline, kanban board, calendar or list. Users can record the time spent on each task and set hourly rates for different jobs. The stopwatch tool helps users keep track of working hours. ActiveCollab also offers invoice and payment tracking features, including automatic reminders for customers when payments are overdue. Support is provided online via email. Monthly, annual and one-time tariff plans are available [3].

JIRA is a bug tracking and project management tool designed for teams of all sizes. JIRA allows you to track the workflow and errors in the project with some features of the Agile methodology. These features include Kanban and Scrum boards, as well as reporting capabilities such as task burnout schedules that help support teams at different stages of the development lifecycle. JIRA integrates with developer tools, and teams can use different APIs and add-ons to fine-tune the needs of each team. JIRA is available as a cloud solution and is compatible with multiple operating systems. It also offers a mobile application. The cost of use for one month is calculated by the number of users in the team. Support is available through the online support portal, online documentation and training videos [4].

BaseCamp is a real-time communication tool that helps teams stay on one page, which is not a traditional solution among project management systems. With to-do lists, calendars, deadlines, and file sharing, BaseCamp allows teams to keep track of the priorities and tasks they need to accomplish. Since 2004, the Basecamp team has focused on developing a simple interface where users can create projects, distribute documents and manage tasks. It is software that allows users to log in anywhere, anytime, anytime, through a web browser or through applications compatible with a large number of mobile devices. Basecamp can be deployed by any organization that should lead the team, including non-profit organizations, startups and customer service firms, in addition, it can be used among freelancers. The tariff plan depends on the size of the file storage and the number of users [5].

Trello is a tool for collaboration, task planning and projects. Used by both software development teams and other departments (marketing, sales, support and HR). The web application provides tools for describing projects, their requirements and workflow so that projects are completed in a systematic and consistent manner. Trello offers a digital whiteboard for creating, organizing and prioritizing tasks. Administrators or managers can define workflows, assign tasks to individuals or teams, set deadlines, and monitor progress. Trello cards allow users to collaborate with each other. Users can add comments, add participants and add documents to their assigned tasks. Trello has a free subscription, but also offers a professional package with the confidential and administrative settings needed for large businesses. Trello integrates with a number of online applications, including JIRA Cloud, BitbucketCloud, Google Drive, GitHub and Slack [6].

Wrike is a cloud-based project management platform for teams of more than 20 people. It comes with Gantt charts, calendars, resource management workload views, special dashboards and real-time updates. This allows you to structure projects and tasks using directories, as well as automatically assign tasks based on their states. Wrike covers a wide range of industries, from finance and technology to creative and advertising activities. Wrike integrates with a variety of tools, including SalesForce, Dropbox, Slack, and AdobeCreativeCloud, and offers an open API. The solution is available to every user based on a monthly subscription.

TeamworkProjects is a cloud-based project management solution that provides functionality to manage various project tasks. Among the functions of the tool: to-do lists, time tracking, downloading files and messages. TeamworkProjects helps teams manage project goals, communicate and set up business processes [7]. TeamworkProjects has a project scheduling feature that allows project managers to define project tasks, assign them to team members, and track ongoing tasks. The solution also includes document management, which allows users to share documents as part of a team. The client payment feature allows users to create invoices based on time spent on work and resource costs. Dashboards provide access to project objectives, and project collaboration features allow you to communicate via mobile devices, so team members and project managers can remotely monitor project implementation. TeamworkProjects can be integrated with applications such as FreshBooks, Dropbox, Google Drive and others. Services are offered on a monthly subscription basis, including telephone and email support.

To select among the analyzed project management systems, select the following criteria:
– ability to manage projects and tasks;
– the ability to build a Gantt chart;
– the possibility of accounting for resources and finances;
– the ability to manage documents;
– the ability to generate reports;
– availability of a mobile application;
– Presence of emoji or stickers.

Based on the results of the analysis of project management systems (Table 1), we can conclude that for large, long-term projects should prefer ActiveCollab, Wrike or TeamworkProjects, as they are able to provide support for complex projects, providing extensive opportunities in time planning, team management and control of all aspects of projects. JIRA, BaseCamp, Trello are better suited for small and medium projects, as they have only basic functions such as task management and teamwork, but their simplicity allows you to quickly set up the production process and provide quality support for small teams, as well as the cost of a license. such systems are much smaller, in comparison with more complex analogues.

According to Table 1, the considered systems have a rich functionality, support work with projects and tasks, have built-in mechanisms for constructing Gantt charts, allow you to automate work with documents and

manage system users. Any of the considered services can be used as a full-fledged project management system. Differences are in additional functions: the possibility of using as a corporate information system, the availability of communication environment, electronic coordination of documents, built-in telephony functions, etc.

In cases where the institution does not want to use third-party developments and has several free web programmers, the most promising direction is the development of web-based applications, despite the fact that desktop (user-installed system) options are in some cases more productive, but they less flexible to customize. In addition, sharing the system for web applications does not require installing the client part on users' computers, which simplifies the deployment process.

Disadvantages of using web-based systems: rather complex system administration, the need to use a single software product, or at least the agreement and harmonization of data formats used, problems that arise when working with data over a corporate network or the Internet.

Conclusions

The activities of a modern organization are inextricably linked with the implementation of a large number of different works, planning and monitoring of which cannot be carried out without taking into account modern advances in information technology. Software solutions are aimed at automation and significantly increase the efficiency of organizations. Given the high cost of owning existing project management software systems on the market, the need to integrate them with other information systems used in organizations is also promising to develop your own solution. This will not only reduce financial costs, but also solve the problem of integration and subsequent mandatory modernization of this system. It should be noted that the latter is one of the determining factors in the choice between own development or purchase of a ready-made solution. The project management system can be developed as an integral part of the corporate information system of the organization, which also combines such components as control over the execution of orders, personnel accounting, preparation of approval of documents, etc. A single management system will raise the efficiency of management of the organization to a whole new, higher level, streamline work processes, combine a variety of activities that require constant analysis and monitoring.

Table 1 – Comparison of project management systems

	Project management	Gantt chart	Resource accounting	Document management	Reports	Mobile application	Smiley stickers
Trello	+	–	–	+	+	+	+
Baseca mp	+	–	–	+	+	+	+
JIRA	+	–	+	+	+	+	+
TeamworkProjects	+	+	+	+	+	+	+
ActiveCollab	+	+	+	+	+	–	–
Wrike	+	+	+	–	+	–	–

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